Modality and subjective semantics

Part I

Special Contribution

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Modality and Subjective Semantics*

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1. Introduction

Innumerable interesting observations remain mysteries yet to be explained within the generative paradigm. It is generally agreed that tag questions like that in (1a) are exceptions to standard syntactic analysis, since the tag here is formed on the lower clause, not on the top clause, as in the case of ordinary tag questions like that in (1b).

(1) a. I don't think Sue left until noon, { *do I? / did she? }
b. He doesn't think Sue left until noon, { does he? / *did she? }

The question arises what unifying principle, if there is one, governs both types of tag questions beyond their apparent differences.

Standard formal logic treats double negative (2a) as equivalent to its positive counterpart (2b), where two negatives cancel each other out.

(2) a. Not all imperatives have no subject.
b. Some imperatives have a subject.

This logical analysis fails, however, to answer the fundamental question why the double negative construction exists independently of its positive counterpart.

These linguistic phenomena, and particularly those of the type which display syntax-semantics discrepancies and defy syntactic analysis, call for principled explanations beyond the boundaries of existing frameworks. In this paper I start afresh and view them from an entirely new perspective.

I will be concerned primarily with proposing and supporting (i) a potentially universal framework for the overall infrastructure of sentence meaning and (ii) the prototypical definition of subjective modality as an integral component of that infrastructure. It is shown that these two jointly serve to provide a principled basis for explaining a wide range of apparently

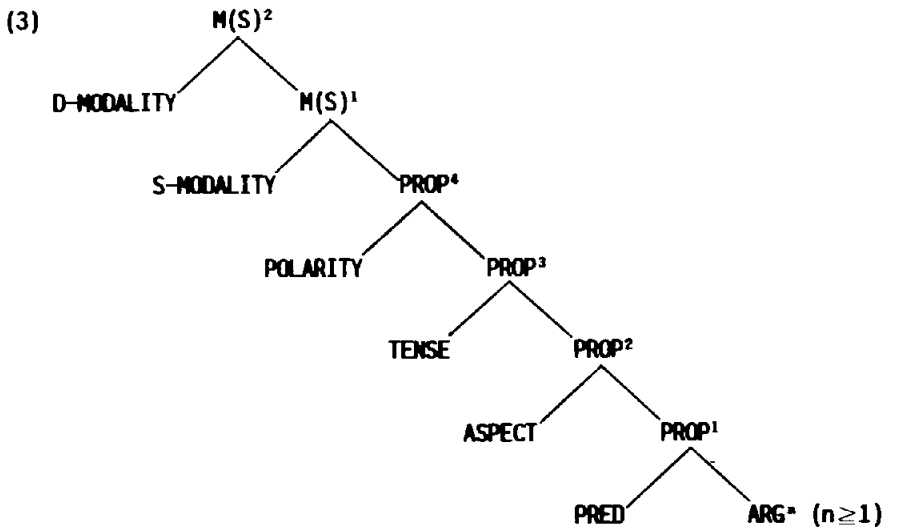
disparate grammatical phenomena, from both English and Japanese examples.

This effort demonstrates the existence of a version of semantics which not only is autonomous from syntax and hence from syntactically-based compositional semantics, but also makes radical departures from logical semantics, represented by truth-conditional semantics.

2. Overview of the Hierarchical Semantics Model

I begin by sketching an overall picture of the framework I have in mind which I am going to defend in this paper. It is presented in (3) in the form of a general representational schema, and for expository purposes I will refer to it as the Hierarchical Semantics Model.

(3)



The Model involves a wide range of, and a great number of, claims which are of course subject to empirical justification. I will first offer a general outline of the main features of the Model, without argument, in the hope that we may view the specific issues I will shortly discuss in broader perspective.

(i) *Potential Universality.* This Model is intended to present an overall framework for the infrastructure of sentence meaning which is potentially universal and thus applicable in principle to any human language insofar as the

component categories of the Model are encoded in the lexicon and grammar of that language. It is thus assumed that there is parametric variation among languages within each individual semantic domain.

(ii) *Hierarchical Structure with Its Own Units and Principles.* No one denies the fact that a sentence has a syntactic structure of its own, apart from the mode in which it may be formulated, but no one has ever made any serious proposal about the overall semantic structure of a sentence independent of its syntactic structure. Our framework is one such explicit proposal, claiming that the meaning of a sentence has a hierarchical structure of its own in the mode it is presented in (3), that is, it has an internal structure consisting of multi-dimensional layers, or precisely six distinct layers, which are governed by the same principle of combination.

(iii) *Components of Sentence Meaning.* The components of sentence meaning in the Model are grouped into four classes: operator, proposition, predicate, and argument. While only the bottommost layer $PROP^1$ (where PROP is short for Proposition) involves a predicate-argument relation, the other binary-branching layers all involve an operator-operand relation, preserving the same isomorphic pattern--isomorphic in that the left-hand component is an operator, while the right-hand component is the scope that the operator encompasses.

(iv) *The Domain of Sentence Meaning.* It is the domain of sentence meaning that is represented as M(S), read 'Meaning of Sentence' or 'Sentence Meaning', which is intended to indicate a point of connection between syntax and semantics, that is, that the input to this Model is the syntactic category of S (short for Sentence). So this representational schema applies equally to whatever counts as a member of the syntactic category of S, including a tensed clause, matrix or embedded, and a non-tensed clause as well, whether infinitival, gerundive or participial. Independent clauses typically display the full configuration of sentence meaning, but non-tensed clauses normally lack the meaning of modality, while retaining the whole or most aspects of propositional meaning. The degree of specification varies from construction to construction.

(v) *Obligatory vs. Optional Domains.* A natural dividing line can be drawn between two types of sentence meaning, $M(S)^1$ and $M(S)^2$. $M(S)^1$ is the obligatory domain of sentence meaning for a clause which can stand on its own, hence representing the full range of sentence meaning, whereas $M(S)^2$ is the extra domain of sentence meaning because it is discourse-laden by virtue of the

inherent nature of D-Modality (short for Discourse-Modality).

(vi) *Sentence Meaning vs. Proposition.* There is a conceptual distinction between proposition and sentence meaning. What is crucial is that although proposition is objective, sentence meaning is no longer objective but eventually takes on the meaning of subjectivity by virture of the nature of the modality component involved. We will come back to this issue in section 6.

(vii) *Core vs. Composite Propositions.* There are four types of propositions which are built up on successive layers in the form of a lower proposition being embedded in the next higher proposition. This is what is represented in the hierarchical relations among $PROP^1$ to $PROP^4$. They can all properly be referred to as propositions because they share one and the same propositional core, represented as $PROP^1$ (named the core proposition), whose internal structure involves a predicate-argument relation, the minimum requirement for whatever may be identified as a proposition. The higher a composite proposition is on the hierarchy, the more complex its internal structure, though preserving the same pattern of configuration, i.e. an operator-operand relation.

(viii) *Two Types of Operators.* There are five different operators: D-Modality, S-Modality (short for Sentence-Modality), Polarity, Tense (used as a cover term for temporality involved in the grammatical tense and temporal expressions), and Aspect. They can all properly be grouped as operators of qualification, as differentiated from operators of quantification like *some, many, all, each, every,* etc. They are further divided into two types: the first type, including D-Modality and S-Modality, is the sentential operator, while the second type, including Polarity, Tense and Aspect, is the propositional operator. While only the sentential operator is subjective, the propositional operator is objective.

(ix) *The Dualism of Propositional Operators.* Furthermore, the propositional operator has a Janus-like property. It not only covers a proposition as its scope within its layer domain, but also it constitutes part of the next higher proposition, thus falling within the scope of the next higher operator. In short, the propositional operator is bi-functional: it is an operator in itself and yet it is propositional in a larger context.

Even from this cursory overview it might be clear that the Hierarchical Semantics Model is an effort to provide a general framework for the overall

infrastructure of sentence meaning, and thus there are indeed numerous claims and assumptions implicit in the Model which call for empirical justification. Since I am not in a position to elaborate on all facets of the Model in the present discussion, I will concentrate only on a discussion of the internal structures of the full sentence meaning $M(S)^1$ and the full proposition $PROP^4$. My immediate goal is to argue for the adequacy of these particular structures through a close examination of certain different grammatical phenomena, mainly from English and partly from Japanese.

3. The Universal Definition of Modality as Explanatory Basis

The most important claim made in (3) is the modal-propositional bistructure thesis, namely, that the full sentence meaning $M(S)^1$ consists of two components: the modal component and the propositional component, represented respectively as S-MODALITY and $PROP^4$.

It is schematically clear from (3) that the internal structure of the full proposition $PROP^4$ is well-defined. It is now necessary to seek to establish a universal definition of the concept of modality which we might expect would work together with the bistructure thesis to lay the foundations for explaining a variety of grammatical phenomena. The definition of modality that is expected to serve for this purpose is presented in (4) in prototypical form:

(4) MODALITY is defined, prototypically, as (i) *a mental attitude* (ii) *on the part of the speaker* (iii) *only accessible at the time of utterance,* where *the time of utterance* is further characterized as *the instantaneous present* (as opposed particularly to *the durational present* and *the past*).

This definition can be construed as a complex of three different conceptual components. If a linguistic expression satisfies none of these conditions, then it can never be an expression of modality. The less central, less prototypical instances of modality expression are those that fulfill only one or two of the three conditions.

In fact, however, the three conditions are ranked in order of importance or

priority. Most important of all is the first condition of mental attitude. It is simply because this condition is nothing other than the conceptual essence of modality. Next in importance is the second condition of speaker involvement. Now, given the fact that no mental attitude can exist independently without its possessor, it follows naturally that these two conditions combine to form the unified concept of a speaker's mental attitude. It is this combination that qualifies a linguistic expression to refer to an individual entity of modality.

The least important of all is the requirement of accessibility at the time of utterance, but nevertheless it is most important in another respect, that is, it is solely responsible for the subjective nature of modality. An expression of modality, and for that matter an expression in general, may be taken to be subjective by virtue of this third condition, but importantly, with the qualification that *the time of utterance* must be construed as *the instantaneous present*. I will return to this issue in section 6.

Before going into further detail, I think it would be helpful in getting a more concrete idea of what is going on here if we observe how particular expressions fit into the prototypical definition of modality I have just proposed.

4. Expressions of Modality as Meaning-Form Pairs

4.1 *Types of Expression of Modality*

The lists in (5) and (6), though not intended to be exhaustive, illustrate some representative types of modality expression from English, together with Japanese-specific types of examples.

(5) a. Epistemic modals (*may, must, can, will, would, should, could, might*)
b. Interjections (*ah, oh, oh gosh!, yes, no, well, in God's name*)
c. Focusing particles (*even, only, also, too, exclusively*)
d. Speaker-oriented adverbials
(i) Adverbials of truth judgment (*perhaps, certainly, no doubt, in my opinion, to be sure, to the best of my knowledge, as far as I know, if I remember correctly*)

(ii) Adverbials of value judgment (*regretably, unfortunately, curiously enough, to my surprise, strange to say*)

(iii) Adverbials of speech act (*frankly speaking, to tell you the truth, although I say it myself, since you ask me*)

(iv) Adverbials of text formation (*briefly, in short, to begin with, last but not least, finally, in the long run*)

e. Japanese honorific verbs (polite *mas-u/des-u*, humble *o-V-su ru* honorific *o-V-nar-u/rare-ru*)

f. Japanese modal predicates (*nitigaina-i* 'must', *kamosirena-i* 'may', *hazu-da* 'should', *yoo-da* 'it seems', *soo-da* 'I hear')

g. Japanese mood particles (assertive *yo*, question *ka*, command *ro*, prohibitive *na*, confirmative *ne*, volitional *yoo*, presumptive: plain *daroo* / polite *deshoo*)

(6) a. Mental verb clauses (*I think/believe/suppose/assume/wonder/regret/doubt; I don't care/mind; I'm (not) sure/certain; I'm afraid/sorry; I take it; I find it odd, I consider it likely, I take it for granted; I would like to know, I only hope; I positively do believe*)

b. Hearsay/happenstance verb clauses (*I hear, I am told, it is said/rumored; it happens/turns out, it seems/appears (to me), it occurs to me, it dawns on me, it strikes/reminds me*)

c. Saying verb clauses = Performative clauses (*I say/assert/claim; I deny/(dis)agree/confirm; I order/promise; I tell/ask you; I thank/apologize*)

d. Hedged performatives (*I regret/am pleased to inform you; I hasten to add; I must confess, May I presume to tell you?*)

If we look through the examples in (5), we see that they each express a mental attitude of the speaker that is only accessible at the time of utterance, but in a different manner and to a different degree. How different they are in manner and degree is a question one can profitably ask, but we are not concerned with it at the moment. Our immediate concern is with the question of meaning-form correspondence. Even a cursory overview of the examples in (5) shows that they range over a wide variety of grammatical categories, lexical

and non-lexical. The point here is that the examples in (5) are all of the expression type in which meaning corresponds neatly to syntactic form.

In contrast, when we look at (6) we notice that the examples all have in common the property of a clausal form, i.e. the form of a matrix clause that characteristically takes (i) the simple present tense verb, and (ii) the first person singular subject. There are, however, a few exceptions in (6b) which have an impersonal *it* subject, along with a so-called experiencer dative in certain cases.

It is from a semantic point of view that the examples in (6) are subclassified. (6a) includes instances of the clause type whose component verb denotes mental state/process/action, so we call it the mental verb clause. (6b), however, includes examples of the clause type whose component verb denotes a mental attitude of the hearsay and happenstance type.

In contrast to these two, there are instances of the clause type, as in (6c) and (6d), where the component verb indicates communication or speech act. (6c) includes what are generally known as performative clauses, and (6d) as hedged performatives—hedged in that a performative clause is modally qualified in such a way as to weaken or soften the illocutionary force it is supposed to have.

4.2 *Meaning-Form Correspondence*

It should be noted that the examples in (6), in contrast to those in (5), are not statable in terms of grammatical categories. In other words, none of them constitutes a syntactic unit, but instead takes the form of a non-constituent word cluster which nevertheless satisfies the prototypical conditions of modality in its entirety, thus constituting a semantic unit.

To illustrate this point, consider the simplest example *I think*. This word sequence is by no means a syntactic unit, since obviously the subject NP and the tensed Verb have no syntactic node of convergence, but nevertheless it comes to be perceived as a semantic unit of modality, as the joint effect of the semantic properties of the component morphemes: the first person pronoun *I* refers to the speaker, the verb *think* refers to a mental attitude of thinking, and the simple present tense form can refer to the instantaneous present. Thus it follows that the sequence *I think* collectively satisfies all the prototypical conditions of modality, eventually being qualified as an expression of genuine

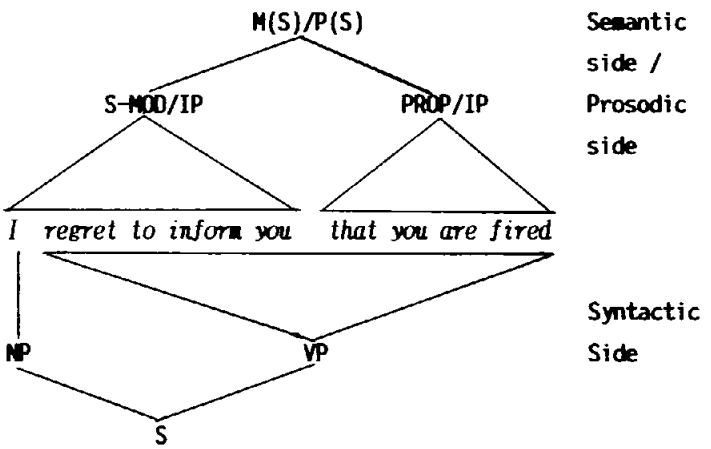
modality.

By contrast, consider the word sequences *I thought* and *I always think.* Neither of them is a prototypical instance of modality expression, simply because both fail to meet the third condition of the instantaneous present, but still there is good reason to say that they are sufficiently modal depending upon the context (as in (36) in section 7.5). This is clearly seen when they are compared with the far less modal *John thinks* and *they thought*, both of which violate the two conditions of speaker involvement and the instantaneous present.

Particularly noteworthy is the fact that although the examples in (6) are not syntactic units, they are prosodic units or, more precisely, intonational units. This can be demonstrated typically by observing where the major intonational break occurs. When you utter, say, *I regret to inform you that you are fired*, observe that the major intonational break occurs right before the complementizer *that* more than anywhere else. It goes something like this: *I regret to inform you / that you are fired*, where *I regret to inform you* is a prosodic unit as well as a semantic unit, but not a syntactic unit.

These two different ways of correspondence between meaning and form can best be represented as in (7), partially in the manner of Sadock (1991).

(7)



Here P(S) and IP are used simply to indicate 'Prosody of Sentence' and 'Intonational Phrase' respectively. Now it is apparently clear that the upper tree structure represents semantic/prosodic parallelism and the gap between the upper/lower tree structures represents semantic/syntactic disparity.

What is strongly suggested here is that where expressions of modality are not syntactic units, they are prosodic units, i.e. intonational units. This then leads us to conclude that meaning-form correspondence cannot be captured properly unless due consideration is given to prosodic form as well as syntactic form. This conclusion sounds quite plausible in view of the fact that a speaker's expression of modality is indeed a surface phenomenon.

5. Modality and Illocutionary Force

5.1 *Performatives as Expression Modes of Modality*

It is important to realize that although performative clauses like those in (6c) and (6d) have been widely discussed within the general framework of speech act, mental verb clauses of the types in (6a) and (6b) have never been viewed from the same perspective. Not only that, but to the best of my knowledge, no serious attempt has ever been made to integrate both performative and mental verb clauses into a coherent whole. My contention here is that both genuine and hedged performative clauses are subsumed under the theory of subjective modality I am proposing, though there is no reason to assume that modality may be integrated into a theory of illocutionary act/force.

It should be noted, in the first place, that mental verb and performative clauses are semantically parallel, hence contrasting members of the same category. Thus observe (8) and (9), where the minimal pairs of contrast are mutually exclusive.

(8) a. { *I ask you / I wonder* } whether he is here or not.
b. *Whether he is here or not, { *I ask you / I wonder* } .
c. Is he here, { *I ask you / I wonder* } .

(9) A: Why { *do you say / do you think* } that he is not coming to class?
B: { Because his wife told me. / Because he is sick. }

In (8), the performative *I ask you* and its mental counterpart *I wonder* neither allow complement preposing, a special case of topicalization, as in (8b), but

instead both do allow complement raising, or to borrow Ross's term, slifting (derived from sentence lifting), as in (8c). (9) illustrates that the interrogative *why* may be associated with either the main or the complement clause. This is equally true of the pair of saying and thinking verbs.

Next, (10) and (11) concern various types of semantic correlation.

(10) a. { *I order / I want* } you to take out the garbage *because* I'm too crazy.

b. { *I tell you / *I'm sure* } that your slip is showing, *in case* you're not aware of it.

c. { **I claim / *I state / I know / ϕ* } John's at Sue's house *because* his car is outside.

(11) a. *Briefly, I promise* you to finish my work today.

b. *In fairness to both of us, we ask* that you please keep us informed of your situation.

c. *Frankly, I think* you're making a big mistake.

d. *To put it kind of crudely, it seems to me* that normal science in linguistics still remains descriptive work.

e. *If I may say so, I would say* that your work needs revision.

f. *Since you ask me, I think* you're being unwise.

The examples in (10) illustrate that it is not only the performative clause but also the mental verb clause that stands in correlation with discourse-level conjunctions like *because* and *in case*. Particularly in (10b) and (10c), the choice between the performative and the mental verb clauses is determined in terms of their compatibility with our pragmatic knowledge about the content of the complement clause.

Similar observations can be made about the examples in (11). It is no wonder that the performative clause is correlative with adverbials of speech act/text formation, as shown in (11a) and (11b). What is crucially relevant, however, is that many different mental verb clauses can also be correlative with speech act adverbials, as is shown in the other examples in (11).

All these examples are clear indications of semantic parallelism between mental verb and performative clauses, thus suggesting that they are different

manifestations of the same semantic category.

Secondly, and even more important, performative clauses semantically entail corresponding mental verb clauses, but not vice versa. What I mean by semantic entailment is that a proposition α necessarily implies a proposition β only in terms of the inherent semantic properties of the component lexical items. (Notice that this terminology differentiates itself from logical entailment in crucial respects. However, I cannot go into further detail here.) Confirmation of this unidirectional entailment comes from examining what the mental attitudes are that four basic types of illocutionary force correspond to: statement, question, direction and offer. Thus I claim that the following semantic entailments hold between performative and mental verb clauses:

(12) a. *I say/state/assert/claim/tell you (that)* $\supset$ *I believe (that)*
b. *I ask/inquire/question (wh-)* $\supset$ *I wonder (wh-)*
c. *I order/request/urge/tell/ask (you to do)* $\supset$ *I want (you to do)*
d. *I promise/offer/vow/pledge/claim (to do)* $\supset$ *I intend (to do)*

The validity of these entailments is further strengthened by the fact that both members in each pair require exactly the same type of syntactic complement, as shown in the parentheses. Notice in particular that one and the same verb may be used ambiguously but in different patterns; thus, say, *tell* between (a) and (c), *claim* between (a) and (d), and *ask* between (b) and (c).

Thirdly, modality is a semantic notion by which I mean that it is determined only in terms of linguistic expression, i.e. independently of extra-linguistic context, while illocutionary force can only be determined relative to extra-linguistic context. Even the illocutionary force of overt performative clauses has no constant value but depends for its value upon the context. Thus for example consider (13).

(13) a. *I promise you* I'll come tomorrow.
b. *I promise* to fire you if you don't hand in your report on time.

(13a) is generally said to have the illocutionary force of a promise, but it may also be used as a threat depending on the context. A more recalcitrant example is (13b). Here given our general knowledge about the situation involved, the

performative *I promise,* despite its linguistic expression, may not be taken literally as a promise, but actually as a warning or threat.

Fourthly, there are further instances where a hedged performative is no longer a performative, but rather behaves like a mental verb clause. Thus observe (14).

(14) a. A: Do you think Sally is pregnant?
B: { I *wouldn't say* she is. / I *would say* she isn't.}
b. A: Is Salisbury a city?
B: Most of us *would say not.*

Here it is observed that the neg-raising pheonomenon applies to *I would say,* which is not the case with the genuine performative *I say.* Since we know that the neg-raising effect is typically found with such weak mental verb clauses as *I think, I suppose, I believe,* it is strongly suggested that *I would say,* although apparently a hedged performative, actually belongs to the class of mental verb clauses, thus serving the direct purpose of expressing modality.

All these observations, taken together, lead us to conclude that performative clauses are, first and foremost, expression modes of mental attitude rather than those of illocutionary force, and fall naturally into the same category of modality as do mental verb clauses. Performative clauses can thus be subsumed properly under a theory of modality, but under no circumstances can modality be subsumed under a theory of illocutionary force.

5.2 *Different Modes of Assertive Modality*

Now I claim that mental verb and performative clauses differ in the mode of assertive modality. Thus observe the paradigm of sentences in (15).

(15) a. { *I think / It seems to me* } that John is married.
b. *I* { *say / assert / tell you* } that John is married.
c. *I* { *regret / am pleased* } *to say* that John is married.
d. John *is* married.

Here we can say that the sentences in (15a) through (15c) involve marked cases of assertive modality, as contrasted with (15d), which involves the unmarked

case, since only this contains no overt expression of assertive modality. The marked cases can further be differentiated in the following manner: The mental verb clauses in (15a) are weak forms of assertive modality, while the performative clauses in (15b) are strong forms of assertive modality, since they differ in the degree of commitment to the truth of the same proposition that John is married. Then how about the hedged performatives in (15c)? I would claim that they are softened versions of the strong form of assertive modality, thus lying somewhere in between the mental verb and the genuine performative clauses.

By contrast, the unmarked case, (15d), is in principle a neutral form of assertive modality, thus indicating a withdrawal of truth commitment, even though it would be used to express categorical assertion by default, unless there is further information to the contrary. Thus observe (16).

(16) a. Morris Halle is *reportedly* fond of saying that autobiography is not science.
b. Intuition, *it is claimed,* is simply an unreliable guide in this area.
c. *According to Dr. Santos,* the cause of death was drowning.

Here it is shown that the unmarked case indicates a speaker's truth-non-committal attitude because of the presence of certain parenthetical expressions like *reportedly, it is claimed, according to Dr. Santos,* which are indeed modal (or modally bounded) expressions of the hearsay type.

6. Modality and Subjectivity

6.1 *The Accessibility Hypothesis*

The definition of modality as presented in (4) specifies that the term *the time of utterance* should be interpreted as meaning *the instantaneous present*, as opposed to *the durational present* on the one hand and *the past* on the other. Since I am claiming that this condition is responsible for the subjective nature of an expression of modality, I will now consider how it should be so.

There is a cognitive constraint, which might be referred to as the accessibility hypothesis, for construing *the time of utterance* as *the instantaneous present*, and it goes something like this:

(17) *The Accessibility Hypothesis*
Of all the mental attitudes which occur simultaneously with the time of utterance, the only mental attitude to which the speaker can have access is that of the speaker himself/herself.

To put it another way, the speaker cannot report on another person's mental attitude unless he/she has already had it made accessible to him/her at the time of utterance. He/she has no choice but to 'describe' a mental attitude insofar as it is someone else's. However, when it comes to his/her own mental attitude, the speaker can either 'describe' or 'express' it. A dividing line can be drawn between whether or not the mental attitude is only associated with the point of time that is instantaneously simultaneous with the time of utterance. Herein lies the crucial reason why the time of utterance must be understood to refer to the instantaneous present. We will look at grammatical evidence to see why it should be so.

6.2 *The Instantaneous vs. the Durational Present*

The grammatical means responsible for this conceptual distinction between the instantaneous and the durational present are the tense forms when they are associated with verbs of mental attitude. Only the verb forms in the instantaneous present tense are oriented towards subjectivity, while the verb forms either in the past tense or the durational present tense are oriented towards objectivity. The durational present tense form has the same effect of a past time implication as does the past tense form, because it has the inherent property of extending from a point in the past up to the present.

To illustrate this point, observe first data from English, as in (18).

(18) a. *I think* that John is a spy.
b. *I always think* that John is a spy.

In English, as can be seen in (18a), the simple present tense form is

potentially ambiguous between the instantaneous and the durational present. Disambiguation can only be done by the context, linguistic or extra-linguistic. Thus observe (18b), where the only available interpretation is that of what is generally known as the habitual present, undoubtedly a special case of the durational present. It is only this interpretation that is semantically compatible with *always*.

Now look closely at the ambiguity of (18a). In the instantaneous present interpretation, the speaker commits himself/herself to the truth of the proposition expressed by the complement clause, i.e. *that John is a spy*, with the epistemic qualification expressed by the main clause *I think*. In this case, therefore, *I think* is an expression of modality in our definition.

In the durational present interpretation, by contrast, the speaker normally commits himself/herself, without any epistemic qualification, to the truth of the proposition expressed by the whole sentence, i.e. *I think that John is a spy*. In other words, the speaker is making an objective report on a mental state of his/her own stretching from a point in the past up to the present. What is involved here is the split ego, i.e. the observed internal self and the observing external self. The split ego is only possible when the speaker as observed object is temporally distanced away from the observer-speaker in the instantaneous present.

In Japanese, however, no such ambiguity arises, because the two interpretations in question are distinguished by the use or non-use of a particular dependent verb *te-i* form, and this is generally said to be a progressive verb, but in fact can best be taken as a function of stativization, thus in effect mapping a punctual situation onto a durational situation.

Now look at (19), where we find two different Japanese counterparts to the English (18a).

(19) Boku wa John ga supai da to { *omo - u* / *omotte - i - ru* } .
I(MALE) TOP NOM spy is COMP think-PRES think-STATE-PRES

The relevant part is that the English *think* in the simple present tense form translates into either *omo-u* 'think-PRES' or *omotte-i-ru* 'think-STAT-PRES'. The only difference here is the absence or presence of the stativizing verb *te-i* form. The plain *omo-u* form points to the instantaneous present, whereas the

augmented *omot-te-i-ru* form points to the durational present.

Therefore we can say that the distinction between the instantaneous and the durational present has a complete lexico-grammatical reflection in Japanese, undoubtedly a clear case where correlation between meaning and form is one-to-one.

6.3 *A Mental Attitude on the Part of the Speaker vs. the Third Person*

There is a grammatical phenomenon in Japanese which makes crucial use of the distinction between the instantaneous and the durational present. First compare (20) and (21) and see how the choice of verb form is dependent upon the choice of subject.

(20) a. I want to drink beer.
b. Boku wa biiru o { nomi-*ta-i* } .
c. I(MALE) TOP beer ACC drink-want-PRES

(21) a. Hanako wants to drink beer.
b. Hanako wa biiru o { *nomi-*ta-i* / nomi *ta-gatte-i-ru* } .
TOP beer ACC drink-want-PRES/drink-want-show signs-STAT-PRES

In order to express the feeling of wish involved in English (20a), with the first person subject, Japanese must employ the *-ta-i* 'want-PRES' verb in the simple present tense, as in (20b). By contrast, in order to express English (21a), with a third-person subject, the same *-ta-i* form is not alone sufficient, but instead the more complex *-ta-gatte-i-ru* form is needed, as in (21b), with two other dependent verbs *-gar(-u)* 'show signs' and *te-i* supplemented to it. This sequence may be translated literally as 'Hanako is showing signs of wanting to drink beer'. From this literal translation it should be clear that the speaker perceives the situation as evidential and hence describes it objectively. When the speaker describes someone else's mental attitude, he must describe it in the form that guarantees that he has had access to the information in question prior to the time of utterance.

This is exactly why a conceptual distincition should be made between the instantaenous present and the durational present, in particular. The speaker can do nothing other than 'express' his mental attitude subjectively insofar as it

occurs in the instantaneous present simultaneous with the time of utterance. However, the speaker can also 'describe' his own mental attitude objectively, just as he does someone else's mental attitude, when it occurred at some point in the past prior to the time of utterance. Modality (hence an expression of modality) necessarily carries an implication of subjectivity precisely because the speaker has it accessible only at the time of utterance as it is understood to be the instantaneous present.

6.4 *The Instantaneous Present as Index of Speaker Involvement*

Futher grammatical evidence comes from a comparison of pairs like that in (22), which contrast minimally in the mental verb tense form and which have one obligatory argument missing.

(22) a. Taro wa matigatte-i-ru to *omo-u.*
TOP mistake-STAT-PRES COMP think-PRES
'I think that Taro is mistaken'

b. Taro wa matigatte-i-ru to *omotte-i-ru.*
TOP mistake-STAT-PRES COMP think-STAT-PRES
(Dominant reading) 'Taro$_i$ thinks that he$_{i/j}$ /it is mistaken'

In the process of interpreting (22), it is incumbent on us to determine WHO thinks WHO is mistaken, particularly whether *Taro* is the subject of the main clause or the embedded clause. Identification of them differs between (22a) and (22b). (22a), with the simple *omo-u* verb form, can only be interpreted as meaning: the SPEAKER thinks TARO is mistaken. It is the SPEAKER, not anyone else, who does the thinking. On the other hand, (22b), with the stativized *omotte-i-ru* verb form, has three possible interpretations in principle: either the SPEAKER, TARO or SOMEONE ELSE can be understood as the subject of thinking, depending on the context. But the most preferred reading would be that TARO thinks that either HE himself or someone else/something is mistaken.

Similar observations can be made about a pair of sentences in (23).

(23) a. Taro wa sake o nomi-sugite- *komar-u.*
TOP alcohol ACC overdrink - feel annoyed -PRES
'I feel annoyed at Taro's overdrinking sake'

b. Taro wa sake o nomi-sugite- *komatte-i-ru*.
TOP alcohol ACC overdrink - feel annoyed -STAT-PRES
'Taro$_i$ is feeling annoyed at his$_{i/j}$ overdrinking sake'

The sentences contrast in verb form between *nomi-sugite-komar-u* 'to feel annoyed at overdrinking' and *nomi-sugite-komatte-i-ru* 'to be feeling annoyed at overdrinking'. Again the question arises WHO feels or is feeling annoyed at WHOSE drinking sake excessively. Again, by the same reasoning, (23a) has a unique interpretation, meaning that it is the SPEAKER, not TARO, who feels annoyed and that consequently it is TARO who drinks sake excessively. By contrast, (23b), although potentially ambiguous, would have the dominant reading that TARO is feeling annoyed at his own or someone else's drinking sake excessively.

6.5 *Summary*

We have seen (i) that the conceptual distinction between the instantaneous and the durational present is perfectly lexico-grammaticalized in Japanese, i.e. between the simple present tense *-ru* form and the stativized present tense *te-i-ru* form, and (ii) that it is only when it occurs at the instantaneous present simultaneous with the time of utterance that a mental attitude is necessarily the speaker's own, and (iii) that that mental attitude takes on subjectivity precisely because only on that particular occasion does the speaker have no option but to 'express' it rather than 'describe' it. Although there is much intuitive talk about subjectivity in the literature, I know of no other serious attempt than ours to probe into the nature of subjectivity from both cognitive and linguistic points of view so as to translate it into more explicit terms and concepts.

In English there is no perfect lexical counterpart to the distinction between the instantaneous and the durational present, but nevertheless there is ample evidence to demonstrate that the distinction is systematically reflected in a wide variety of grammatical constructions, thus causing contrasts in grammaticality. Predominant among them are the tag question construction, the double negative construction, and various types of sentential anaphora constructions, which we will proceed to discuss in the immediately following sections.

7. Modality and Tag Questions

7.1 *Syntactic vs. Semantic Analysis*

The most telling argument for the Hierarchical Semantics Model, particularly for the joint effect of the modal-propositional bistructure thesis and the prototypical definition of modality, comes from a consideration of the phenomenon of tag questions in English.

As is well known, the most frequent kind of tag is the tag of contrasting polarity, as in:

(24) a. John likes his job, doesn't he?
b. The boat hasn't left, has it?
c. Mary said that John thinks the war is ending,
{ didn't she? / *doesn't he? / *isn't it? }

Thus the tag has the opposite polarity to that of the main clause: in (24a) positive *John likes his job* takes a negative tag, while in (24b) negative *The boat hasn't left* takes a positive tag. The form of the tag is largely predictable from that of the main clause. It may be derived from the main clause by reversing the polarity, converting to an interrogative, replacing the subject where necessary by a pronoun, and deleting everything except the inverted auxiliary-subject portion. Furthermore, if a sentence has two or more clauses, the tag question is usually formed on the top clause. It is evident from (24c) that it is impossible to form the tag on any but the top clause.

As you may recall, this whole idea is basically what generative grammar in its earlier days attempted to formulate in terms of transformation. But at the same time, it has long been known that there is a group of recalcitrant counterexamples to any syntactic analysis. Typical examples are those in (25):

(25) a. *I think* this car needs a tune-up, {*don't I? / doesn't it? }
b. *I don't suppose* the 49ers will lose, {*do I? / will they? }
c. *It doesn't seem to me* like it's gonna rain, {*does it? / is it?}

What is special about these examples is that the tag corresponds to the complement clause, but not the matrix clause, in flat contradiction to the

syntactic generalization outlined above. A question then arises: what makes these examples different particularly from (24c) in tag formation? In light of the fact that they exhibit no difference whatsoever in syntactic structure, it is strongly suggested that the source of the difference must be sought in semantics and pragmatics. As far as I know, there has been no serious attempt to find a unifying principle of explanation which covers not only the normal (24) but also the apparently abnormal (25).

To approach this goal, it is important first of all to understand the communicative function of the tag question construction. It is generally agreed that the primary function of standard tag questions is for the speaker to seek the interlocutor's opinion or confirmation about the truth of what he wants to know. In her paper 'On assertive predicates'(1975: 105), Joan B. Hooper goes on to make the following generalization:

(26) A tag question may be formed from the main assertion of a sentence if it is a speaker assertion about which the speaker may express doubt.

While I agree with this well-thought-out generalization, it should be emphasized that the question remains of exactly how to identify the main assertion of a sentence. This is the crucial question we need to answer if we are interested in seeking a principled explanation in semantics.

Looking at the sentences in (25) afresh from our new perspective, we become fully aware that they have one thing in common, namely, that each of the matrix clauses *I think, I don't suppose, It doesn't seem to me,* in its entirety, fulfills the prototypical definition of subjective modality, thus constituting a unified whole indicating a speaker's present attitude of uncertainty about, or lack of confidence in, the truth of the content expressed by the complement clause, which eventually amounts to the full propositional domain of $PROP^4$ in our framework.

It should now be clear that the syntactically normal (24) and the syntactically exceptional (25) are equally governed by the same semantic principle. The preceding observations reveal that a basic generalization about tag formation can be captured in terms of our theory of modal-propositional bistructure, together with our theory of modality. It would look something like (27).

(27) The tag question is formed on the full propositional domain of $PROP^4$ (i.e. the subject and verb of the tag refer back to the subject and verb of the full propositional domain of the host clause).

This means that tag formation cannot be captured only in terms of syntactic objects, but even more important, it must make crucial reference to semantic objects, specifically what is characterized here as $PROP^4$. It should be emphasized that this formulation is only made possible given the initial bifurcation of sentence meaning into the modal and the propositional components along with the prototypical definition of modality presented in (4).

7.2 *Negation Within Modality*

When I say that such phrases as *I don't suppose, It doesn't seem to me* are expressions of modality, one might ask how the negative *not* could be said to be a proper subpart of an expression of modality. It is intuitively clear, however, that this type of expression indicates a speaker's positive stance which has a negatively oriented content. Thus it is quite plausible to assume that, say, *I don't think (that)* has the internal structure of *I think it not-true/untrue/false (that)*, just as more or less idiomatic expressions like *I find it doubtful, I consider it unlikely, I hold it as false* do. The point is that since a negative element belongs in the lower subpart, the upper subpart and hence the whole phrase retain a positive epistemic stance.

And there is in fact syntactic evidence in favor of this intuitive understanding. Observe the sentences in (28).

(28) a. *I do not in the least think* that John is a liar, is he?
b. *I don't believe* that you two have not met, have you?
c. *I'm not sure* that's important, is it?
d. *I'm afraid* he's forgotten his lecture notes again, hasn't he?
e. *I don't think* Sue left until noon, did she?

In (28a) the negative *not* in the main clause cannot have been raised from the complement clause, since it must be correlative with *in the least* in the main clause, as evidenced by the ungrammaticality of **I in the least think that*

John is not a liar. In (28b) the negative *not* in the main clause cannot have been raised, either, because the complement clause also has a negative of its own. Some native speakers might not find those tag questions acceptable, but even for those speakers, (28a) and (28b) are perfect without the tag parts. And this alone is sufficient proof that *not* in the main clause is placed in situ.

In (28c) as well, *not* in the main clause is taken to be where it should be since *sure*, unlike *think, believe* and *suppose*, is by no means a so-called raising predicate, and *I'm not sure* is understood as equivalent to *I'm unsure.* In (27d), *I'm afraid* semantically has a negatively oriented content, although syntactically it does not contain a predicate negative *not.*

Now turning to (28e), where *not* is apparently separated from its correlative *until noon*, we see that even in this case, there is no need for neg-raising, because the correlation in question can be guaranteed by the fact that *until noon* is inside the semantic scope of *not* even though they are not within the same clause.

All the preceding observations clearly show that there is nothing wrong with the idea that the negative *not* can serve as a proper subpart of an expression of modality.

7.3 *Minimal Pairs of Contrast as Crucial Evidence*

It is always a good idea to find and compare various minimal pairs of contrast in the hope that the minimal difference in form might reveal the crucial contrast in meaning behind them. The pair of sentences in (29) is one such example, the only difference being whether the main clause is interpreted as falling in the instantaneous or in the durational present.

(29) a. *I think* Ann is twenty, {*don't I? / isn't she?}
b. *I always think* things are difficult, {don't I? /*aren't they? }

In (29a) the tag corresponds to the complement clause, while in (29b) the tag corresponds to the matrix clause. As should be clear now, what makes these different can be reduced to the difference in semantic structure between them. Tag formation is dependent on whether the matrix clause expresses modality or propositional content. In (29a) *I think* is a typical instance of subjective modality which indicates a speaker's attitude of truth assessment only

accessible at the time of utterance, while in (29b) *I always think* is no longer a typical instance of subjective modality, because although it still indicates a speaker's attitude of truth assessment, it extends to the durational present, thus providing an objective description of his own present habitual assessment about the current circumstances. In both cases, therefore, it is clear that the tag corresponds to what amounts to the full proposition of the host clause, which in turn confirms the correctness of the generalization formulated in (27).

Another minimal pair of contrast, shown in (30), again demonstrates that it is crucially relevant to differentiate the instantaneous present from the durational present.

(30) a. *I imagine* that there are ghosts in this room, aren't there?
b. *I am imagining* that there are ghosts in this room, aren't/ain't I?

It is confirmed here that the basic generalization correctly applies to either case. In (30a) the tag is formed on the lower clause, because it is the lower clause that forms the full propositional domain of the host clause. In (30b), by contrast, the tag is formed on the top clause, because it is the top clause that forms the full propositional domain of the host clause.

The only formal difference is in the top clause, between *I imagine* and *I am imagining*. And this is related to the difference in their semantic status. *I imagine* involves the simple present tense, which in turn indicates the instantaneous present, while *I am imagining* involves the progressive present tense, which in turn indicates the durational present. It is thus *I imagine*, but not *I am imagining*, that serves as an expression of subjective modality.

Second, the formal difference is correlative to the difference in the lexical meaning of the verb *imagine*. Thus *I imagine* in (30a) belongs with *I think*, *I suppose* and similar others, while *I am imagining* in (30b) means that the speaker is intentionally exercising his ability of forming an image or a mental picture. It is thus (30a), not (30b), that conveys the implication that the speaker believes in the truth of the proposition expressed by the complement clause, i.e. that there are ghosts in the room in question.

A similar pair of contrastive examples can be cited which corroborate the preceding generalization about tag formation.

(31) a. *It seems* that this meeting will never end, will it?
b. *It's possible* we'll be arriving right on time, isn't it?

It is clear that the semantic status of the top clause is different between the two sentences in (31). As is the case in (31a), *it seems*, although potentially ambiguous, typically falls into the class of modality expression, particularly with either extra stress on *seems*, or *to me* added right after *seems*, as in *it seems to me*. Thus we know that it is the complement clause that expresses the full proposition of the whole host clause. That is why the tag is formed on the complement clause. In (31b), by contrast, *it's possible* does not serve as an expression of modality, but as an expression of propositional content. That is why the tag here is formed on the top clause rather than the lower clause.

Independent evidence for the contrast in semantic status between *it seems* and *it's possible* is furnished by a comparison of the sentences in (32).

(32) a. Unfortunately, it seems [$_{p4}$ he forgot his keys].
b. Fortunately, [$_{p4}$ it's possible that Sandy will remember to bring the potato salad].

The adverbs *unfortunately* and *fortunately* are no doubt expressions of modality, specifically denoting the speaker's value judgments accessible only at the time of utterance, and function as qualifying operators that take the full proposition PROP^4 as their scope. In (32a) *it seems* is understood to be outside the scope of *unfortunately*, and thus they jointly qualify over the proposition expressed by the complement clause, i.e. that he forgot his keys, since it eventually amounts to the full proposition of the entire sentence, as is shown in the brackets labeled PROP^4. In (32b), however, *fortunately* is understood to qualify over the remainder of the sentence, with *it's possible* in it, since it forms part of the full proposition PROP^4, as shown again in the brackets.

7.4 *Non-Neg-Raising Mental Predicates*

Further supporting evidence for our semantic analysis of tag formation comes from another different group of examples as in (33).

(33) a. *I know* that it's not very important, is it?

b. *I don't know* that it's very important, is it?
c. *I'm not sure* that's right, is it?
d. *I can't see* that it matters, does it?

These examples are found in Ray Cattell's paper 'Negative transportation and tag questions'(1973), which is full of interesting data and insightful observations. Here again we observe that the tag is formed on the complement clause, but it should also be noted that the verbs in the main clauses are not so-called neg-raising verbs, as opposed to previous examples. Compare the first two sentences in (33). Obviously they mean completely different things, and so clearly *know* is not a neg-raising verb. Second, *know* here is not a factive verb, either. *I don't know*, which Cattell notes must be obligatorily followed by *that*, would ordinarily be used as basically equivalent to *I'm not sure*. Although there are many other things to consider, it is sufficient for our present purposes to recognize that the phenomenon of tag formation in these examples also follows naturally from the basic generalization presented in (27).

Briefly, the main clauses in (33), i.e. *I know*, *I don't know*, *I'm not sure*, *I can't see*, each fulfill the prototypical conditions of modality, thus constituting expressions of genuine modality. To be noted in particular are the cases with the negative *not* in them. As we have seen in (28), it would be incorrect to assume that *not* in *I don't know* negates *I know*. On the contrary, *not* combines with *I know* to form a unified concept of modality only expressible in a hyphenated form as in *I-don't-know*. Similarly for *I'm not sure*. Fortunately, however, this phrase is certainly convertible into *I'm unsure*, which correctly suggests a positive stance with a negative connotation, i.e. uncertainty. It should now be clear that the tag is formed on the complement clause simply because the content of the complement clause amounts to the full propositional domain of the whole host clause.

7.5 *The Most Recalcitrant Examples of Tag Question*

What appears to be the most difficult to explain of all possible tag questions is such an example as that in (34).

(34) a. *I find it difficult to believe* that Harry stayed sober, did he?
b. [$_S$ I find [$_S$ it difficult [$_S$ to believe [$_S$ that Harry

stayed sober]]]]

Cattell (1973) finds this acceptable in his dialect of Australian English. Interestingly enough, (34a) exhibits the greatest possible discrepancy between form and meaning. Notice first that this example resists any reasonable syntactic analysis since the host clause contains four clauses, as is shown in (34b), and the tag is formed on the most deeply embedded of all. But in fact we have no independent grounds for tag formation in (34a) from the point of view of syntax. By contrast, however, our framework provides the basis for this type of tag questions as well: the reason why the tag here is formed on the most deeply embedded clause *Harry stayed sober,* and not on any higher clause, is precisely because it is that portion of the host clause that forms the full domain of proposition, and the tag is generally formed on the full domain of proposition.

It should then be expected that the first three clauses *I find it difficult to believe,* in this linear sequence, constitute a unit of modality, and as expected, it is understood to be virtually equivalent to the expression *almost unbelievably* despite their radical differences in syntactic status.

(35), again taken from Cattell (1973), is another peculiar example--peculiar in that it contains sort of a hedged performative but with the second person as subject.

(35) *You must admit* (that) the book is obscene, {isn't it? / *mustn't you?}

Here the main clause *you must admit* might be taken to be a less prototypical, if not the most prototypical, instance of modality expression, because of the second person subject. But it may still be viewed as sufficiently modal, because otherwise it would follow that *you must admit* formed part of the propositional content in the host clause and the tag were permitted in the form of *mustn't you?*, but *mustn't you?* is in fact impossible here.

Another example most challenging to syntax is presented in (36), which appears in John R. Taylor's monograph entitled *Linguistic Categorization: Prototypes in Linguistic Theory* (1989: 150).

(36) But *I thought* the concert began at 8, { doesn't it? / didn't it? }

Although Taylor has nothing to say about the past tense tag *didn't it?*, I am told by native speakers that it is also possible, and it is in fact appropriate in a different situation from that of the present tense tag *doesn't it?*, i.e. in a situation where the concert took place in the past. Here I will confine myself to the present tag case since it poses an additional interesting problem.

Taylor asserts of the present tense tag example that when 'uttered in a situation in which both speaker and addressee are preparing to go to a concert' the sentence has the tag 'obligatorily in the present tense'. In that situation, the 'speaker has just received information which causes him to doubt the present-time factuality of the proposition "The concert begins at 8"', and 'is questioning the apparent counterfactuality, at the moment of speaking, of the proposition'. What is at issue is a present rather than a past state of affairs. This is exactly why the present rather than the past tense is chosen in the tag.

There are two points immediately relevant to our analysis. The first point is that *I thought* is an expression of modality. Although the thinking verb is in the past tense form, it actually refers to a mental process of recollection of the speaker which has occurred at the time of utterance. Then it follows that it is the complement clause *the concert began at 8* that amounts to the full proposition of the host clause. This provides the first half of the reason why the tag is formed on this complement clause.

The second half of the reason results from the fact that the verb of the complement clause is in the past tense form but actually refers to the present schedule about a future event. The past tense form can simply be taken to be a function of sequence of tenses. If tag formation were entirely governed by syntactic principle, then it would always be forced to result in the *didn't it?* tag form, an inappropriate form under circumstances of the type we are considering. But our framework provides the means for dissolving this syntax-semantics disparity because it specifies the semantic structure of a sentence independently of its syntactic structure. It is important to note that, unlike our semantic framework, no syntactic analysis can provide a principled basis for deciding between the two alternative tag questions.

8. Modality and the Double Negative Construction

8.1 *Formal Logic vs. Natural Logic*

It is well known that in English there are two different kinds of multiple negative construction. One is the multiple negative construction in nonstandard English whose function it is to intensify negation, as is shown in (37a) which is virtually equivalent to the standard English (37b).

(37) a. *No* one *never* said *nothing* about it.
b. *No* one *ever* said *anything* about it.

The other type is the multiple negative construction of the type established as standard English where two negatives, if not more than two negatives, occur in the same clause and apparently cancel each other out, producing positive values. Here I will confine myself to this standard version of double negative construction.

We find a wide variety of examples of this version, as in (38).

(38) a. I haven't done *nothing.*
b. *No one* has *nothing* to eat.
c. *Not many* people have *nowhere* to live.
d. *Not all* imperatives have *no* subject.
e. I *can't not* obey her.

There seems to be general agreement, particularly among formal semanticists, that these sentences are truth-conditionally equivalent to those in (39) respectively.

(39) a. I have done *something.*
b. *Everyone* has *something* to eat.
c. *Most* people have *somewhere* to live.
d. *Some* imperatives have *a* subject.
e. I *have to* obey her.

A comparison between (38) and (39) reveals that what is involved here is a

logic of cancellation, i.e. the logic of two negatives canceling each other out. The question then arises why the double negative construction exists independently of its positive counterpart. In this logical analysis, there is no explanation whatsoever for this fundamental question, but instead there is simply a strong suggestion that formal logic underdetermines natural logic, just as syntax underdetermines semantics.

8.2 *Logic and Psychology of Double Negation*

When we look at this construction more closely, however, we see that it has a logic of its own. In his book *The Philosophy of Grammar* (1924: 332), Jespersen has something to say about it.

(40) Whenever two negatives really refer to the same idea or word the result is invariably positive; this is true of all languages. . . . The two negatives, however, do not exactly cancel one another. . . . The psychological reason for this is that the *detour* through the two mutually destructive negatives weakens the mental energy of the listener and implies. . . a hesitation which is absent from the blunt, outspoken [form, as is seen in a case in which] *I don't deny that he was angry* is weaker than *I assert that he was angry.*

I am inclined to agree basically with Jespersen, but I would like to go further into detail about precisely what is going on in the psychology of the speaker. The following discourse sample, taken from J. Hurford and B. Heasley's *Semantics: A Coursebook* (1983: 284), I hope will help understand the initial motivation for the actual use of the double negative construction:

(41) A: You and Jim really must come round to my place some evening.
B: Yes, we'd like to.
A: Of course, you two don't drink, do you?
B: Well, we *don't not* drink.

What is crucial here is to consider why it is that in response to speaker A's statement *Of course, you two don't drink, do you?*, speaker B didn't choose to say *Yes, we do (drink)* instead of *Well, we don't not drink.* Notice that this

alternative would be a flat contradiction to the immediately preceding statement of speaker A, thus indicating a straightforward confirmation about their capability and eagerness to drink. By contrast, speaker B's statement with double negatives would convey the message that they may not be too anxious to drink but it is not true to say that they never drink.

8.3 *Modal vs. Propositional Negation*

Now I am in a position to turn to our main theme and talk about the semantic basis for this pragmatic motivation of the double negative construction. The point I would like to make here is that there is a division of labor between the two negatives: the internal (or second) negative plays the role of forming a negative proposition, while the external (or first) negative plays the role of forming a negative modality. This negative modality characteristically describes an attitude of denial—denial in the sense that it contradicts something that has already been said or implied. This interpretation is confirmed clearly in the previous discouse. Observe that speaker A makes a negative statement, i.e. that you two don't drink, and then speaker B responds by resorting to the form of superimposing another negative upon Speaker A's negative statement, thus resulting in the double negative construction.

This result fits perfectly into the Hierarchical Semantics Model I am proposing. Speaker B's last statement can properly be represented as having basically a semantic structure represented in (42a), and its Japanese counterpart can be adduced in support of this analysis, as shown in the pair of (42b) and (42c).

(42) a. $[_{MOD}$ I DENY$]$ $[_{P4}$ NOT $[_{P3}$ WE DRINK $]]$

b. [sake o nomu - *na* - *i* $_{S}$] [wake-de wa *na* - *i* $_{S}$]
alcohol ACC drink -not-PRES reason TOP not-PRES

c. [[SAKE-O NOMU $_{P3}$] NA-I $_{P4}$] [WAKE-DE WA NA-I $_{MOD}$]

Here the notation I DENY is intended to represent a speaker's present mental attitude, rather than force/act, of denial, and this semantic representation provides the semantic basis for the characteristic use of the double negative construction.

When we look at the Japanese counterpart (42b), we see that it consists of

two separate clauses, with two occurrences of the negative *na-i* 'not-PRES' distributed in different clauses, and further that the main clause *sake-de wa na-i* 'it is not the case' expresses a modality of denial and the complement clause *sake-o nома-na-i* '(we) don't drink sake' expresses a negative proposition. So (42b) has a semantic structure represented in (42c). Here we see that the modal-propositional bistructure of the full sentence meaning is directly reflected in the bi-clausal syntactic structure.

Other similar examples of the double negative construction are presented in (43). It will be confirmed that the same basic generalization holds equally for these examples.

(43) a. If a tree is a beech, it can*not* at the same time be *not* a beech.
b. John is*n'* *t* deliberately *not* being considered for the job.
c. Well, I just would *not not* sunbathe on such a beautiful day.
d. Why *not not* clean the kitchen tonight?

8.4 *Syntax of Double Negation*

Looking briefly at the formal side of the double negative construction, syntax needs to have a means for generating a clause with double negatives anyway. But the real problem is that syntax will have to allow overgeneration once it allows the occurrence of two negatives within a single clause, since we know of no general way to prohibit more than two negatives within a single clause while allowing either one or two negatives. Indeed we do not find such multiple negative sentences as (44).

(44) a. *John must*n'* *t* have *not* been *not* listening at that time.
b. * *Not* many of the boys did*n'* *t* kiss *not* many of the girls.

Particularly of (44a), which is taken from Akmajian, Steele and Wasow's joint work 'The category AUX in universal grammar' (1979), the authors say that it is 'virtually uninterpretable' though it should be generated within their framework which allows one negative per verb. The point is that no syntactic analysis provides a principled explanation for the grammatical distinction between the double negative and the more than two negatives construction, although our semantic framework does, because it predicts correctly that there

are exactly two, but not more than two, semantic slots for negation to fill in at the clausal level.

8.5 *Another Type of Negation: Local Negation*

In fact, however, it should be noted that there is another type of negation, generally known as local negation or constituent negation. It is thus quite possible that three negatives occur within a single clause insofar as they have different functions. A typical example is (45a):

(45) a. Chomsky *doesn't not* pay taxes for *nothing*.
b. [$_{MOD}$ I DENY] [$_{P4}$ NOT [$_{P3}$ CHOMSKY PAYS TAXES FOR NOTHING]]
c. It *isn't* the case that Chomsky *doesn't* pay taxes for *nothing*.
d. It *isn't* the case that it is for *nothing* that Chomsky *doesn't* pay taxes.
e. It *isn't* for *nothing* that Chomsky *doesn't* pay taxes.

(Let me note parenthetically that about two decades ago I found this great sentence recorded in a book on linguistics whose title I fail to recall--great because it documents the habitual situation of a single individual that pertained in the late 1960s in the midst of the Vietnam War.)

Notice that the three negatives in (45a) have different roles, as is shown in (45b) in our framework. The first negative serves as a negative modality of denial, the second one as a negative proposition, and the last one as local negation or constituent negation, where the scope of negation remains within the immediately related major phrase, in this case, a prepositional phrase. The point is that while local negation forms part of propositional content, there is no crossover in scope between local and propositional negation, hence there is no conflict between them. This point can be clearly illustrated by such paraphrases as (45c) through (45e): (45c) is a direct reflection of the semantic structure of (45b), and (45e) is a cleft-version of (45c), where *for nothing* is brought into the focus position of the top clause by way of the intermediate (45d). This whole process illustrates precisely the way in which the original (45a) is purported to be interpreted, in particular, the way in which the element of focus is associated with the modality of denial.

9. Modality and Sentential Anaphora

9.1 *Full Proposition vs. Polarity-Neutral Proposition*

A third type of grammatical evidence which is deeply rooted in semantics can be presented by various phenomena of sentential anaphora, those traditionally known as sentential deletion and substitution. The discussion to follow will focus on some typical instances from English, but similar observations can be made for Japanese.

Observe first minimal discourses like those in (46).

(46) A: Do you think they can come tonight?
B: { I believe so. / I believe not. / I don't believe so. }

One remark is in order about expressions like *I believe not*. Although here the negative *not* was formerly said loosely to be a sentential proform, it should be recognized that it is nothing other than a negative. Since there is good reason to assume that there is a sentential gap after *not*, it is that gap that I assume to be a sentential proform; call it the zero anaphor. Thus here we have two sentential anaphors: *so* and the zero form. In addition, we know that pronouns like *it, this, that* are also used as sentential anaphors.

In the early days of generative grammar, it was generally assumed that sentential anaphora was a syntactic process, but in more recent years within the general framework of Government and Binding, it would most likely be treated as an interpretive process in the Logical Form component. But both frameworks have failed, to the best of my knowledge, to offer a comprehensive description of, let alone a unified explanation for, a wide variety of sentential anaphora in English. Here I would like to show that sentential anaphora is indeed a semantic process, being entirely based on the system of hierarchical semantic structure we are working with.

Given our framework, the sentences in (46) will be represented as having the following semantic structures, as intuitively expected:

(47) A: $[_{MOD}$ DO YOU THINK] $[[_{P4}$ POS $[_{P3}$ THEY CAN COME TONIGHT]]
B: a. $[_{MOD}$ I BELIEVE] $[[_{P4}$ POS $[_{P3}$ SO]]
b. $[_{MOD}$ I BELIEVE] $[[_{P4}$ NOT $[_{P3}$ ϕ]]

c. $[_{MOD}$ I DON'T BELIEVE $]$ $[[_{P4}$ POS $[_{P3}$ SO $]]$

One comment is necessary before going further. Notice that *Do you think?* in (46A) constitutes a complex unit of modality as a whole, or to put it more precisely, a modally bounded/framed expression. Analytically, it is a superimposition of the speaker's attitude of question I ASK upon YOU THINK, where the hearer's thinking is also perceived as only accessible at the time of utterance. This analysis may be viewed as well-motivated when we are aware that there is invariably an interchange of subject between speaker and hearer in a question-answer discourse, creating a perfect symmetry within the modal domain. Here the modal status of *you think* in (46A) is confirmed by its complementarity to clearly modal *I (don't) believe* in (46B). Now given the representations in (47), the sentential anaphors *so* and ϕ in (47B) can be taken uniformly to refer back to the polarity-neutral proposition $PROP^3$ in (47A), as is intuitively required.

A close examination of various types of sentential anaphora along the same lines reveals that a basic generalization can be stated as in the following:

(48) Sentential proforms like *so*, ϕ, *it*, *this*, *that* refer back to either the polarity-neutral proposition $PROP^3$ or the full proposition $PROP^4$.

In other words, the antecedents of sentential anaphors are either $PROP^3$ or $PROP^4$. It should be emphasized that this generalization is not statable in syntactic terms, because there is no independent basis we know of in syntax for the crucial distinction between $PROP^3$ and $PROP^4$. Now we will furnish confirming evidence for the adequacy of the principle formulated in (48).

9.2 *The Truncated Clause*

There are many different types of discourse environments where the sentential *so* and zero anaphors occur. Consider first (49), where it is shown that the zero-form invariably refers back to $PROP^3$, the domain of polarity-neutral proposition.

(49) a. I may not be able to come with you. I'm not sure yet ϕ.

b. $[_{MOD}$ MAY$]$ $[_{P4}$ NOT $[_{P3}$ I WILL BE ABLE TO COME WITH YOU$]]$

c. It may be that I will not be able to come with you.

Notice that the semantic structure of the host clause in (49a) is represented as in (49b), which is indeed intuitively correct, in view of the fact that the host clause can be paraphrased precisely as (49c). Now turning to the second clause of (49a), it is understood to mean *I'm not sure yet that I will be able to come with you,* and now it becomes clear that the zero-form corresponds back to the polarity-neutral PROP^3 part of the host clause, thus excluding both the modal *may* and the negative *not* from its antecedent domain. It is the semantic structure of (49b) that has provided the basis for the zero anaphor interpretation.

Also with (50) and (51), it is confirmed that the zero form refers back to the polarity-neutral PROP^3 portion of the host clause.

(50) a. A: Could that be his new girlfriend? B: Surely not ϕ.
b. [$_{MOD}$ COULD] [$_{P4}$ POS [$_{P3}$ THAT IS HIS NEW GIRLFRIEND]]

(51) a. I don't think he's coming, and I can guess why not ϕ.
b. [$_{MOD}$ I DON'T THINK] [$_{P4}$ POS [$_{P3}$ HE IS COMING]]

9.3 *The* As-*Clause*

Secondly, there is a different class of sentential anaphora, associated with the *as*-clause. From a comparison of the two sentences in (52) it is clear that the zero form refers back to either the full proposition PROP^4 or the polarity-neutral proposition PROP^3, depending on the verb involved.

(52) a. John is not ill, as you know ϕ.
b. John is not ill, as you claim ϕ.

In (52a) the missing complement of *know* is normally understood as meaning that John is NOT ill, thus refering back to the full proposition PROP^4, while in (52b) the missing complement of *claim* is understood as meaning that John IS ill, thus refering back to the polarity-neutral proposition PROP^3. This clearly shows that whether the negative is or is not involved in the interpretation of the zero anaphor depends upon the lexical nature of the verb involved in the *as*-

clause.

Compare further the sentences in (53), where the host clause and the *as*-clause are reversed in order.

(53) a. John was not dead, as many people had thought ϕ.
b. As many people had thought ϕ, John was not dead.

(53a) would normally be interpreted ambiguously with respect to the missing complement of *think*, but not (53b). Thus in (53a) the *as*-clause would mean either that many people had thought that John was NOT dead, or that many people had thought that John WAS dead. In (53b), however, the *as*-clause is unambiguously interpreted as meaning that many people had thought that John was NOT dead, with the negative included in its interpretation. It is thus clear whether the sentential zero form refers back to the polarity-neutral proposition PROP^3 or the full proposition PROP^4 depends upon the order of clauses, as well as the associated verb.

9.4 *The Parenthetical Tag Construction*

Next consider (54), which illustrates another different type of construction, what might be called the parenthetical tag construction.

(54) a. John believes that Sally is honest, I suppose ϕ.
b. I believe that Sally is honest, I suppose ϕ.
c. [$_{\text{MOD}}$ I BELIEVE] [$_{P4}$ SALLY IS HONEST]

A comparison of (54a) and (54b) reveals an interesting fact about sentential anaphora. In (54a), the missing complement of *I suppose* is understood as referring back to the whole host clause, while in (54b) the missing complement is understood as referring not to the whole host clause, but only to the complement clause, i.e. *that Sally is honest*. The question arises what makes this difference. Obviously we cannot resort to syntax since there is no difference whatsoever in syntactic structure.

From the vantage point of our semantic framework, however, we become fully aware that there is a significant difference in semantic structure. In (54a) it is the whole host clause that constitutes the full proposition, while in (54b)

it is the complement clause that constitutes the full proposition and it is the main clause *I believe* that serves as the modality component. This is shown in (54c). Now we know eventually that the sentential zero form here refers back to the full propositional domain of $PROP^4$ of the host clause. It is important to ascertain again that an expression of modality is precluded unequivocably from sentential anaphora.

Another example of the parenthetical tag construction is given in (55), which illustrates that the sentential anaphora can only be captured in terms of the distinct layers of semantic structure that we are assuming in our framework.

(55) a. Harry might not come, I don't suppose ϕ.
b. *I don't suppose that Harry might (not) come.
c. I don't suppose that Harry will come.
d. $[_{MOD}$ MIGHT] $[_{P4}$ NOT $[_{P3}$ HARRY WILL COME]]
e. It might be that Harry will not come.

Missing in (55a) is the complement of *I don't suppose.* The whole tag clause is understood as meaning not that *I don't suppose that Harry might (not) come,* as shown in (55b), but that *I don't suppose that Harry will come,* as shown in (55c). Particularly noteworthy here is that the missing complement *Harry will come* forms no syntactic proper part simply because the host clause does not even contain this particular sequence itself, let alone this sequence as a constituent.

By contrast, our framework has an intricate enough internal structure to accord with this factual observation, thus assigning to the host clause the correct semantic representation, as in (55d), which has independent support from the fact that the host clause can be paraphrased precisely as (55e). The crucial point here is that *might* functions as the modal component while the future time element implicit behind it, represented as WILL, functions as part of the propositional component. Based on this semantic structure, we can see that the antecedent of the zero anaphor in the tag clause amounts exactly to the polarity-neutral proposition $PROP^3$.

9.5 *The Negative Question-Answer Pair*

Now let's turn to the sentential *so* anaphor. First it is confirmed that it

refers back to PROP^3. Observe the discourse in (56).

(56) A: a. Weren't they the right size?
b. [$_{MOD}$ NOT] [$_{P4}$ POS [$_{P3}$ THEY WERE THE RIGHT SIZE]]
B: I thought so, but they turned out to be too big.

Speaker A had had the expectation that they were the right size, but now encounters a situation which appears to conflict with that expectation. Under such circumstances speaker A's utterance would normally be construed as asking whether it is NOT correct that they were the right size, but not whether it is correct that they were NOT the right size. Therefore this negative is understood not as a propositional negation, but as a modal negation which can be characterized as a mental attitude of denial, because it functions to contradict the previous expectation. This should be clear from our discussion of the double negative construction in the preceding section.

Given this observation, the Hierarchical Semantics Model provides speaker A's utterance with the semantic structure represented as in (56A-b). Under this representation, we can now specify that the proform *so* in speaker B's utterance refers back to the polarity-neutral portion of PROP^3, which is in turn realized as it stands as PROP^4 because the polarity-positive operator POS (short for Positive) is the unmarked case for polarity value, as opposed to the polarity-negative operator NEG, which is the marked case.

There are also cases where the sentential proform *so* takes the full proposition PROP^4 as its antecedent. First observe the examples in (57).

(57) a. It seems that Tom is not quite well, at least it seems so to me.
b. [$_{MOD}$ IT SEEMS] [$_{P4}$ NOT [$_{P3}$ TOM IS QUITE WELL]]

(58) a. John hasn't found a job yet. He told me so yesterday.
b. [$_{MOD}$ I DECLARE] [$_{P4}$ NOT [$_{P3}$ JOHN HAS FOUND A JOB YET]]

In (57a) the semantic structure of the host clause is correctly represented in terms of our Model as in (57b), where the modal and the propositional component correspond respectively to the main and the complement clause of the host clause in (57a). Then the proform *so* in the tag clause is also correctly

understood to refer back to the the full propositional domain of PROP^4, which happens to be constituted by a negative proposition. Similarly with (58a), another example in which sentential *so* refers back to the negatively polarized full proposition PROP^4, as may easily be seen from (58b), the semantic structure representation for the host clause of (58a), where I DECLARE is intended to represent the unmarked case of assertive modality (for discussion, see section 1.5).

9.6 *Sentential* It

Finally, a couple of observations are made about sentential *it*. Observe the sentences in (59).

(59) a. Although Bob may not be a nut, many people have claimed it and I think so too.
b. It won't rain, since the weatherman predicted it.

In (59a), both *it* and *so* can be replaced by *Bob is a nut*, with *may not* excluded from their domains of interpretation, thus eventually referring back to the polarity-neutral propositional domain of PROP^3.

By contrast, observe (59b) (which incidentally was invented by Haj Ross two decades ago). Here the pronoun *it* is interpreted ambiguously, presumably the choice of preferred reading depending upon the speaker/hearer's confidence in the weatherman. It can mean either that it WILL rain or that it WON'T rain. In this case, sentential *it* may refer back to either PROP^3 or PROP^4.

9.7 *Summary*

We have seen that sentential anaphors are potentially ambiguous in antecedent domain between the full propositional domain of PROP^4 and the polarity-neutral propositional domain of PROP^3, the choice depending on the types of construction, the order of clauses, and certain lexical properties, together with general knowledge and understanding.

This whole observation has the following implications, among others: (i) The distinction between the propositional domains of PROP^4 and PROP^3 plays a crucial role in various types of constructions of sentential anaphora. (ii) Sentential anaphora interpretation takes place unequivocally within the

objective domain of propositional content, thus precluding the entire component of modality. (m) Sentential anaphora is a semantic process, not a syntactic process, since it makes crucial use of semantic objects which find no parallels in syntax.

Now it should be stressed again that these implications all follow naturally from the Hierarchical Semantics Model and particularly that the hierarchical system of semantic structure in the Model lays the foundation for explanations of a wide variety of what are apparently syntactic phenomena.

10. Concluding Remarks

10.1 *Essential Features of The Hierarchical Semantics Model*

While I must admit that the preceding discussion is limited in scope when compared with whatever topics would come under the heading of *Modality and Subjective Semantics*, nevertheless it should be clear that it has covered the central core of the agenda in an attempt to propose the Hierarchical Semantics Model and substantiate the essential features of the Model from a holistic point of view which I hope bridges the gap between the generative and the cognitive paradigms.

First, the Model is intended as a potentially universal framework for the overall infrastructure of sentence meaning and thus it provides a new general perspective from which to view and construe linguistic phenomena within and across languages.

Second, the Model incorporates both the subjective and the objective aspects of constant meaning into a unified whole. The subjective aspects of meaning are formulated as falling within the domain of modality, while the objective aspects of meaning are formulated as falling within the domain of proposition.

Third, the Model captures the interrelationships among the subsystems in terms of successive layers that retain the same general pattern of internal configuration. Among the subsystems are particularly those of modality, negation, tense, aspect and predicate-argument structure. While these subsystems have been widely discussed individually, there has been no serious attempt to bring out what subsystems constitute a whole system and how they are interrelated to one

another.

Fourth, the Model claims, as has partially been justified, that the meaning of a sentence is basically structured, i.e. it has an invariant skeletal structure, and that the semantic structure of a sentence exists independently of its syntactic structure, since it is made up of its own units with its own principles of combination, none of those units and principles having exact parallels in syntax. Thus we have the consequence that the formal and semantic sides of a linguistic expression are governed by different, if not unrelated, principles of formation, hence the adequacy of a modular approach to language to the extent that it fits in with linguistic facts.

10.2 *Implications of Theory of Subjective Modality*

First, our theory of subjective modality provides explanatory bases for different linguistic phenomena within and across languages. The category of modality is defined both systemically and conceptually. Systemically the unit of modality constitutes a pairing of initial sentence meaning with the unit of proposition, while conceptually it is characterized prototypically in terms of the interaction of three component properties which are ranked in order of importance. In short, the concept of modality thus defined has turned out to have explanatory power. In this respect, it is incomparable to any precedent, since although modality has been well-studied, it is only intuitively understood and thus ill-defined.

Second, our theory of modality accommodates the subjective nature of modality in terms of the interaction of a speaker's mental attitude with the time of utterance as it is construed as the instantaneous present. The concept of subjectivity, just like the concept of meaning, cannot be well-defined unless it is replaced by some (set of) other more explicit terms and concepts. I know of no other serious attempt than ours made along these lines, although there is much speculative talk of subjectivity in the linguistic and philosophical literature.

Third, our theory of modality subsumes overt performative clauses like *I assert, I tell you, I would like to suggest* and *I regret to say* as modes of expression of modality, rather than as modes of expression of illocutionary act/force. The reason is that we are primarily interested in constant aspects of sentence meaning and that modality is one such clear manifestation but not

illocutionary force. Illocutionary force, like modality, is subjective in our sense to be sure, but they are distinct from each other in that it is only modality, but not illocutionary force, that derives, context-independently, from linguistic expression alone. There is thus good reason to assume that overt performative clauses are subsumed under our theory of modality, but conversely there is no good reason to assume that mental verb clauses like *I think*, *I am certain*, *I don't know* and *I would prefer* are subsumed under any theory of illocutionary force.

10.3 *General Implications from the Hierarchical Semantics Model*

For one thing, the Hierarchical Semantics Model represents an autonomous semantics--autonomous from syntax. Hence it is significantly divergent from compositional semantics of the type based on syntactic structure, represented by interpretive semantics, since our Model is by no means an auxiliary component to syntax which assigns interpretation compositionally to syntactic objects.

For another, the Hierarchical Semantics Model represents a subjective semantics—subjective in that it accommodates the subjective aspects of meaning on equal terms with the objective aspects of meaning insofar as they constitute constant parts of sentence meaning. In this sense, the Model is radically divergent from truth-conditional semantics, which concerns exclusively the propositional content of sentence meaning while typically incorporating in it the results of objectifying what are subjective aspects of meaning in our sense of modality.

To illustrate this point, compare the following sentences:

(60) a. John *may* be married.
b. *Possibly* John is married.
c. *It is possible that* John is married.
d. *There is a possibility that* John is married.

The sentences differ in the choice of expression of possibility. However, standard modal logic would assign them the same logical structure in terms of an operator of possibility, thus regarding them as truth-conditionally equivalent.

In fact, however, it is observed that they tend to figure in different contexts. John Lyons points out in his *Semantics Vol. 2* (1977: 806) that *may*

cannot easily occur in the *if-* clause, as in:

(61) If it *may* be raining, you should take your umbrella.

And he goes on to say of this type of utterance that it is 'undoubtedly rare'. The reason is that although *may* is normally used subjectively, nevertheless it is forced to be construed objectively in this particular context.

With alternatives like *it is possible that* and *there is a possibility of*, by contrast, Lyons notes that there is no such difficulty, as in:

(62) a. If *it is possible that* it will rain, you should take your umbrella.
b. If *there is a possibility of* rain you should take your umbrella.

Here I would claim that these alternative expressions are used objectively because they are inherently propositional. Independent evidence comes from the fact that *may* is futher insertable into them, as in *it may be possible that* and *there may be a possibility of* .

The whole preceding observation thus provides supporting evidence for our Model of subjective semantics over truth-conditional semantics, and strongly suggests that fine-grained semantics of the type we have pursued so far is indispensable to understanding the nature of natural language semantics.

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